

**APPLICATION FOR UNITED STATES LETTERS PATENT**

**by**

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**for**

**A SYSTEM AND METHOD FOR PROVIDING AN AWAY-FROM-HOME  
CALLING SERVICE**

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# A SYSTEM AND METHOD FOR PROVIDING AN AWAY-FROM-HOME CALLING SERVICE

## BACKGROUND

### 5 Field of Invention

The present invention relates generally to the field of provisioning telephony services. More specifically, the present invention relates to the field of provisioning telephone services for telephone subscribers who are not at home.

### Background of the Invention

Telephone use permeates our daily lives, and access to telephone service is required to function productively in modern society. Most people take access to such telephone service for granted. Moreover, access to telephone service enables mobility, allowing people to travel away from home without losing the ability to communicate with others. Consequently, telephone companies strive to facilitate access to telephone service for people who travel away from home.

For example, calling cards allow people to make telephone calls for a fee from telephones that they do not own, for example, public pay telephones. To use a calling card, a caller dials a calling card access number. Once a connection is established, the caller is generally directed to enter a calling card number and security code, often referred to as a personal identification number (PIN). The calling card number corresponds to the billing account number for the caller. The PIN provides a mechanism for confirming that the caller has authority to use the calling card.

There are two varieties of calling cards: prepaid and non-prepaid. With prepaid calling cards, a user pays a certain amount of money to a calling card provider. The amount is credited to the user's account prior to using the card. The user can then make fee calls using the card until the amount in the user's account is exhausted. Generally, prepaid calling cards are rechargeable. That is, more money can be paid into the calling card account to increase the amount in the account. In addition, prepaid calling cards usually charge a fixed cost per unit time, generally minutes.

There are several disadvantages to using prepaid calling cards. Because there is a fixed cost per minute, calls often cost more than they should. This is because prepaid calling cards do not take advantage of special rates, for example, lower rates offered for telephone calls made at night. Moreover, a conversation ends when the prepaid amount runs out, whether the caller desires to end the conversation or not. In addition, there is often a surcharge per call. The surcharge is an overhead charge that does not provide the caller with any additional connection time. Further, many prepaid calling cards do not require authorization prior to their use. Consequently, there is little protection when a prepaid calling card is lost or stolen.

A second type of calling card is a non-prepaid calling card. A non-prepaid calling card is generally provided by a telephone company to a user. When the user desires to make a telephone call, he or she dials a calling card access number provided by the telephone company and is prompted to enter a calling card number,

a security code and the desired telephone number. Unlike prepaid calling cards however, there is no limit to the length of the conversation. Charges accrue for the entire length of the telephone call. The user is billed for telephone calls at the end of a period, generally a month.

5         Despite the unlimited calling time, there still remain disadvantages with non-prepaid calling cards. There is usually a surcharge added to each call. Moreover, the rates for non-prepaid calling cards are generally higher than for calls made from home or using prepaid calling cards.

10         A more significant disadvantage of using calling cards, whether prepaid or non-prepaid, and with conventional away-from-home telephone service in general, is that the subscriber does not have access to the services provisioned on his or her home telephone line. Consequently, when people travel, they do not have access to the services they have become accustomed to when using their home telephones.

## **SUMMARY OF THE INVENTION**

15         The present invention overcomes the disadvantages of conventional systems by allowing a telephone user to make a telephone call from remote telephones as if he or she was making the telephone call from his or her home telephone. Thus, a subscriber can make a telephone call from a hotel or pay telephone for example, but be billed as if the call originated from the subscriber's home telephone. The  
20         subscriber can also take advantage of any services that he or she may have provisioned on their home line, including for example, conference calling and call forwarding. Thus, the present invention effectively provides an extension of the

subscriber's home telephone when the subscriber is using a telephone away from home.

A key advantage of the present invention is that it bills users at the rate of the subscriber's local phone. Thus, when a subscriber is away from home and uses the present invention he is charged as if he or she is using his or her local telephone, despite any charges that would otherwise be incurred.

In addition, the present invention allows a subscriber to access services that he or she may have provisioned on his or her home line and use them from a remote telephone as if he or she was using her home telephone. For example, if a subscriber has conference calling provisioned on his or her home telephone, he or she can use that feature when using a remote telephone. Thus, for example, a subscriber in a hotel room can use the present invention to make a telephone call and then conference in a third person, just as if the subscriber were performing the same operation using his or her home phone.

In one embodiment, the present invention is a system for providing away from home calling service in which a telephone subscriber makes a telephone call. The system includes a telephone switch coupled telephonically to the subscriber telephone. A trigger is provisioned on the switch to intercept telephone calls that will use the away-from-home calling service. A service control point is coupled to the telephone switch to receive an authentication request from the switch. The system also includes a line database for storing authentication and verification information as well as service information regarding the home telephone services

provisioned on the telephone subscriber's home telephone line. The line database provides information regarding the telephone subscriber's home telephone services to the switch in response to a query from the service control point. Using the returned information, the system is able to provide away-from-home calling service to the telephone subscriber.

In another embodiment, the present invention is a method for providing telephone services provisioned on a subscriber's home telephone line when the subscriber is away from home. The method includes the steps of provisioning a trigger on telephone switch that is encountered when a telephone subscriber attempts to use home telephone lines services while away from home, requesting authorization and validation information from the subscriber in response to the trigger. Further, the method includes the steps of requesting authorization and validation information, transmitting that information to a service control point, and confirming that the subscriber is authorized access to the away-from-home calling service. If the user is authorized, then the step of returning telephone services provisioned on the subscriber's home telephone line to the switch is performed.

Thus, one object of the present invention is to provide access to home telephone services to subscribers when they are away from home.

Another object of the present invention is to provide telephone subscribers with reduced telephone charges when they are away from home.

Yet another object of the present invention is to create an alternative calling card service that provides increased functionality over existing calling cards.

These and other objects of the present invention are described in greater detail in the detailed description of the invention, the appended drawings and the attached claims.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

5           Figure 1 is a schematic diagram of an away from home calling service system according to a preferred embodiment of the present invention.

Figure 2 is a flow chart for a method of performing an away from home calling service according to a preferred embodiment of the present invention.

## **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

10           Figure 1 illustrates schematically a system 100 according to a preferred embodiment of the present invention. System 100 is owned preferably by a service provider (not shown) that provides the away-from-home calling service described herein. A telephone subscriber 102 dials an access telephone number to gain access to system 100. Preferably, the telephone number is a toll free number, such as the  
15           well-known 800 service. An SSP 104 intercepts telephone subscriber 102's telephone call using any of a number of well-known triggering techniques, for example a public office dialing plan (PODP) or termination attempt trigger (TAT) trigger. In response to the trigger, SSP 104 prompts telephone subscriber 102 for his or her home telephone number and a security code, preferably a personal  
20           identification number ("PIN"). Telephone subscriber 102 enters this information using the telephone keypad. In a preferred embodiment of the present invention, the telephone number and PIN are printed on an away-from-home calling card,

which telephone subscriber 102 can carry with him or her. In the preferred embodiment, the information entered by telephone subscriber 102 is transferred to SSP 104 using well-known DTMF signalling. SSP 104 then queries line information database (LIDB) 110, as explained below, to verify and authenticate telephone subscriber 102 using the information entered by telephone subscriber 102. LIDB 110 contains information on the various services that are provisioned on a particular line, including, for example, long distance service provider, special local services, etc. Although shown as a device separate from SCP 108 in Figure 1, LIDB 110 can be co-located with SCP 108.

SSP 104 accesses database 110 through signaling transfer point (STP) 106 and service control point (SCP 108) using the SS7 network and its signaling techniques. The SS7 network and signaling techniques are described in U.S. Patent No. 5, 701, 301 and ANSI standard document IT.110-1992, *Signaling System No. 7 (557) - General Information*, both of which are incorporated by reference herein in their entireties. SCP 108 acquires the telephone number and PIN entered by telephone subscriber 102 from SSP 104 over the SS7 signaling system. Using the entered telephone number as an index, SCP 108 queries LIDB 110 to obtain the PIN associated with the entered telephone number. SCP 108 compares the obtained PIN with the PIN entered by telephone subscriber 102. If they match, the telephone subscriber is authorized to use the card. Consequently, SCP 108 sends a user authorized message back to SSP 104, and processing continues as described below.





number to use the service provided by the present invention, SSP 104 directs the call to service node 107. Service node 107 performs the prompting to telephone subscriber 102 to obtain the necessary information for authentication and validation for telephone subscriber 102.

5           When the call reaches service node 107, it encounters a basic rate interface (BRI) or primary rate interface (PRI) termination event. As is well-known, the trigger type depends on the trunk type that the call is carried on. Upon encountering the termination event, service node 107 prompts telephone subscriber 102 for the information required to allow the subscriber to use the service of the present invention, for example, telephone number and PIN. Service node 107 passes the information obtained to SCP 108 to authenticate and validate telephone subscriber 102 by querying LIDB 110. In addition, the services provided on telephone subscriber 102's home telephone line are obtained by query to LIDB 110. After telephone subscriber 102 is authenticated and validated, service node 107 prompts telephone subscriber 102 to dial the telephone number of called party 116. The call is completed, if possible, as if telephone subscriber 102 had made the call from his or her home telephone.

To provide access to the services provisioned on the home telephone number, telephone subscriber 102's home service information is transmitted to SSP 104.

20   The home service information includes both telephone subscriber 102's local information and long distance information, for example, long distance carrier, and any services that telephone subscriber 102 has than can be used from a remote

location. These services can then be accessed by telephone subscriber 102 from the remote location. It should be noted that the present invention can be used with any kind of telephone.

In an alternative preferred embodiment of the present invention, telephone subscriber 102 is assigned an away-from-home account number, which he or she enters after dialing the access telephone number. Using a lookup table, SCP 108 determines the subscriber's telephone number from the away-from-home account number. The lookup table can be stored in LIDB 110 or some other database. Processing continues as described above for the case where the subscriber enters his or her telephone number.

Referring to Figure 2, a flow chart illustrating the flow of a telephone call according to a preferred embodiment of the present invention is illustrated. In step 202 calling party 102 dials an access number, *e.g.*, an 800-number as described above. The telephone call reaches SSP 104 in step 204 where it encounters a trigger (*e.g.*, a TAT or PODP trigger as described above). The trigger causes SSP 104 to send a request to SCP 108 to authenticate and validate telephone subscriber 102 in step 206. The request also includes a request to obtain the services provisioned for telephone subscriber 102's home telephone line. This request is routed by STP 106 to SCP 108. In step 208, SCP 108 instructs SSP 104 to play a prompt to telephone subscriber 102 to enter his or her authentication information, *e.g.*, telephone number and PIN. As described above, the authentication information can be printed on an away-from-home calling card that the telephone

subscriber 102 carries. Telephone subscriber 102 enters this information. SSP 104 receives the information and transmits it to SCP 108 in step 209. Using the information received from SSP 104, SCP 108 queries LIDB 110 in step 210 to authenticate and validate telephone subscriber 102. Preferably, this authentication and validation includes a database lookup to compare telephone subscriber 102's telephone number with LIDB 110 records to ensure that telephone subscriber 102 is a subscriber of the away from home calling service of the present invention, and to ensure that the PIN number is correct. SCP 108 also obtains the services provisioned in step 211. In an alternate preferred embodiment, SCP 108 obtains telephone subscriber 102's home services at the time it performs the authentication and validation of telephone subscriber 102. These services are transferred to SSP 104 in step 212.

If the user is validated and authenticated, SCP 108 prompts telephone subscriber 102 to enter the number of called party 116 in step 214. The call is then routed to called party 116's SSP 114 for completion to called party 116 in step 216. Any signaling required to transfer the telephone call from SSP 104 to SSP 114 is routed through STP 112.

If telephone subscriber 102 is not validated or authenticated in step 209, SCP preferably instructs SSP 104 to send a message to telephone subscriber 102 indicating that authorization and/or validation has failed. Preferably, SSP 104 prompts telephone subscriber 102 to retry the information. A maximum of three attempts is allowed in the preferred embodiment. If telephone subscriber 102 fails

authorization and/or validation three times, SSP 104 terminates the telephone call.

In a preferred embodiment of the present invention, SSP provides an explanation for terminating the telephone call, that is, that the maximum number of failures has been reached, prior to terminating the telephone call.

5           The foregoing disclosure of embodiments of the present invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise forms disclosed. Many variations and modifications of the embodiments described herein will be obvious to one of ordinary skill in the art in light of the above disclosure. The scope of the invention is to be defined only by the claims appended hereto, and by their equivalents.

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